PRELIMINARY TECHNOLOGY ASSESSMENT

Networked Lighting

What is this Technology?

This technology capitalizes on the digital nature of LED lighting to connect lights and associated sensors to one another and to a building's IT network. The result is a rich array of location-specific data on room occupancy, daylight, temperature, humidity, and other variables. Using this data, the technology mediates environmental, user, and building information in order to achieve both energy savings and user satisfaction. This technology adapts two proven IT network protocols: Zigbee Wireless and Power over Ethernet—the former is beneficial for retrofits, the latter offers data and electrical power in a single wire for cost savings in new construction.

Why is GSA Interested?

LED lighting has proven to significantly reduce energy consumption while increasing occupant visual comfort and is rapidly becoming the dominant commercial lighting technology. Networked lighting promises to extend the benefits of LED beyond lighting by creating an information pathway that provides extensive capability for improved management of multiple aspects of the office environment, including lighting, temperature, air quality, occupancy and work processes.

ENERGY EFFICIENCY On the basis of LED usage alone, networked lighting can provide 41% energy savings over lighting systems that use the typical recessed three-lamp T8 fixture. The technology promises to further reduce energy consumption by 35% with occupancy and daylight sensors. Beyond LED energy savings, networked lighting can facilitate management and efficiency of other building systems, such as HVAC.

COST-EFFECTIVENESS Because this is a late stage pre-commercial technology, mature market prices are not yet available. Based on current deployments and early estimates, however, the manufacturer claims payback of eight years for a system installed in a building of one million square feet. Costs are projected to decline as LED products gain market share and installers become more familiar with networked lighting systems, further reducing payback.

OPERATIONS & MAINTENANCE System commissioning and controls management are accomplished with remote access. Monitoring and maintenance times should be reduced through embedded luminaire-based diagnostics and the increased operational lifespan of LED lamps. The system may offer additional maintenance cost reductions as building management systems are integrated.

DEPLOYMENT POTENTIAL Because of the flexibility in installation requirements gained by various power and control wiring systems, this technology has broad deployment potential.

The Green Proving Ground program has commissioned Lawrence Berkeley National Laboratory to perform real-world measurement and verification of networked lighting in a pilot installation in a federally-owned building. Findings from the evaluation are anticipated to be available in 2016.

GPG
Green Proving Ground Program

The Green Proving Ground program leverages GSA's real estate portfolio to evaluate innovative sustainable building technologies. The program aims to drive innovation in environmental performance in federal buildings and help lead market transformation through deployment of new technologies.